UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/782,339	02/13/2001	Masahiko Hirose	04558/048001	7852

22511 7590 02/21/2003

ROSENTHAL & OSHA L.L.P.
1221 MCKINNEY AVENUE
SUITE 2800
HOUSTON, TX 77010

EXAMINER	
MENON, KRISHNAN S	
ART UNIT	PAPER NUMBER
1723	11

DATE MAILED: 02/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/782,339	Applicant(s) HIROSE ET AL.	
	Examiner Krishnan S Menon	Art Unit 1723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 January 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *10* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

This is a supplemental action in addition to the office action that was mailed on 2/4/03. This supplemental action was necessitated by the IDS sent by the applicant which crossed mail with the above stated office action.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1,2,4,5,11,12,15 and 16 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by JP 11-010146.

JP 146 teaches plurality of composite reverse osmosis membrane modules in multistages (figures and specification) with at least one final and one prefinal stage, modules having porous support and polyamide skin layer, selected portion of permeate from prefinal stage supplied to the final stage and rest mixed with the permeate of the final stage as in instant claims 1 and 2; permeated water supplied to the final stage is adjusted to be alkaline at pH about 8 as in instant claims 4 and 5; The salt rejection or prefinal stage at least 99.5% with flux at least 0.3 m3/m2 day, when operating at 3.5% salt, pH 6.5 and 5.5 MPA at 25C, as in instant claims 11 and 12; The final stage module has at least 99% salt rejection, 0.7 m3/m2/day flux for 0.05% salt water at pH 6.5, 25C and 0.75 MPA as in instant claims 15 and 16.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

1. Claims 3, 6-10, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 146 in view of Bray (US 4,046,685).

JP 146 teaches all the limitations of the instant claims as in claim 1, and the quality of the feed water as in instant claims 17 and 18, but does not teach splitting the permeate stream from the pre-final stage to two and feeding only one of them to the final stage. Bray (685) teaches (Fig 1,2 and col 5: 4-35) the splitting of the permeate stream to two separate streams, taking first permeate stream, having a lower salt content, from the feed (upstream) end and the second permeate stream having a higher salt content from the retentate end. Bray (685) has a string of modules in a housing, connected in series by the permeate tube, with the feed from one end of the housing and the permeate from the other end. His means for splitting the permeate stream is blocking the through passage in the permeate tube link at a convenient location inside the housing so that the two

permeate streams have a substantially different salt content. The ratio of the salt content in Bray's teachings is 2:1 (Fig 2).

It would be obvious to one of ordinary skill in the art at the time of invention to use the Bray (685) teachings to split the permeate flow from a pressure vessel having a string of modules and then feed only that part of the split flow which has the higher salt concentration to the next/final reverse osmosis membrane stage to "advantageously employ" the apparatus (see Bray abstract) in the teaching of JP 146.

2. Claims 13,14 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 146 in view of EP(1 136 116 A1).

JP 146 does not disclose the additional limitations of claims 13, 14 and 20 over claim 1, such as performance values of the membranes used for rejection of Boron and the membrane having bromine atoms. EP(116) teaches the types of membranes to be used, their performance values for seawater and for Boron separation, and particularly, membrane containing Bromine atoms. The membrane performance values in EP (116) are better than 99.5% salt rejection from water at 3.5% salt content at 25C and pH 6.5 with better than 0.m3/m2/day of flux at 5.5 Mpa, and boron rejection better than 92% at 5ppm feed.

It would be obvious to one of ordinary skill in the art at the time of invention to use the membrane taught by EP (116) with the teachings of JP 146 for obtaining the desired Boron separation

3. Claims 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP 146 in view of Bray (685) as applied to claim 3 above, further in view of EP (116).

JP 146 in view of Bray (685) as applied to claim 3 above does not disclose boron in the permeate as less than 1 mg/L. EP(116) discloses a membrane that treats the seawater to reduce the TDS sufficiently and Boron to < 1 ppm. One of ordinary skill in the art at the time of invention would chose the membrane taught by EP(116) with the teaching of JP 146 in view of Bray (685) for the desired separation of Boron from sea water.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S Menon whose telephone number is 703-305-5999. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L Walker can be reached on 703-308-0457. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Krishnan S. Menon
Patent Examiner
February 19, 2003

W. L. WALKER
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700